CLAIM(S):

1. A microactuator for selectively altering a position of a transducing head carried by a slider in a disc drive system with respect to a track of a rotatable disc having a plurality of concentric tracks, the disc drive system having an actuator arm attached to a load beam for supporting the slider over the rotatable disc, the load beam having a stationary region and a moving region, the microactuator comprising:

means for flexibly coupling the stationary region of the load beam to the moving region of the load beam; and

means for selectively altering a position of the slider with respect to the rotatable disc, the means extending from the distal end of the stationary region to a proximal end of the moving region generally along a longitudinal centerline of the stationary region.

2. A microactuator for selectively altering a position of a transducing head carried by a slider in a disc drive system with respect to a track of a rotatable disc having a plurality of concentric tracks, the disc drive system having an actuator arm, the microactuator comprising:

a load beam attached to a distal end of the actuator arm, the load beam having a first section;

a flexure for supporting the slider carrying the transducing head; and

a bending motor attached between the first section of the load beam and the flexure, the bending motor being deformable in response to a control signal applied thereto.

3. The microactuator of claim 2 further comprising a flexible beam connected between the first section of the load beam and the flexure, and wherein the bending motor is attached to the flexible beam.

4. The microactuator of claim 3 wherein the bending motor is attached to a top surface of the flexible beam such that the flexible beam supports the bending motor and transforms a force on the flexure into a compressive load on the bending motor.

5. The microactuator of claim 4 wherein the electroactive element is constructed from a member of the group consisting of a piezoelectric material, an electroactive ceramic, an electroactive polymer, and an electrostrictive ceramic material.

6. The microactuator of claim 3 wherein the load beam has a first section and a second section, the second section connected to the flexure, and further wherein the flexible beam is connected between the first section and the second section of the load beam.

7. The microactuator of claim 2 wherein the bending motor comprises:

a bottom electrode;

an electroactive material on top of the bottom electrode, the electroactive material constructed such that it has two portions poled in opposite directions; and

a top electrode on top of the electroactive material;

wherein the electroactive material bends in plane in response to control signals supplied to the bottom electrode and the top electrode.

8. The microactuator of claim 7 wherein the electroactive element is constructed from a member of the group consisting of a piezoelectric material, an electroactive ceramic, an electroactive polymer, and an electrostrictive ceramic material.

9. The microactuator of claim 2 wherein the bending motor comprises:
a bottom electrode;
an electroactive material on top of the bottom electrode, the electroactive material uniformly poled;
a first top electrode disposed on top of a first longitudinal half of the electroactive material; and
a second top electrode disposed on top of a second longitudinal half of the electroactive material;
wherein the electroactive material bends in plane in response to control signals supplied to the bottom electrode and the first and second top electrodes.

10. The microactuator of claim 2 wherein the bending motor comprises:
a bottom electrode;
a first electroactive element on the bottom electrode;
a shared electrode on the first electroactive element;
a second electroactive element on the shared electrode; and
a top electrode on the second electroactive element.

11. The microactuator of claim 10 wherein the top electrode comprises:

a first top electrode element disposed on top of a first longitudinal half of the electroactive material; and

a second top electrode element disposed on top of a second longitudinal half of the electroactive material;

12. The microactuator of claim 2 wherein the bending motor has a length to width ratio of at least about ten.

13. A disc drive suspension comprising:

an actuator arm having a proximal end and a distal end;

a load beam attached to the distal end of the actuator arm, the load beam having a mounting region at a proximal end, a head suspension near a distal end, and a flexible region between the mounting region and the head suspension;

a flexure configured to support a transducing head;

a beam connected between the head suspension and the flexure of the load beam; and

a bending motor attached to a top surface of the beam such that the beam supports the bending motor and transforms a force on the flexure into a compressive load on the bending motor, the bending motor being deformable in response to a control signal applied thereto.

14. The microactuator of claim 13 wherein the beam is constructed from steel and has dimensions such that the in-plane resonance frequency of the beam and the distal portion of the head suspension is less than about three kilohertz.

15. The microactuator of claim 13 wherein the flexible region of the load beam includes a first flexible beam and a second flexible beam having transverse creases such that the load beam has a first mode out-of-plane resonance frequency of greater than about two kilohertz and a second mode out-of-plane resonance frequency of greater than about six kilohertz.

16. The microactuator of claim 13 wherein the bending motor comprises:

a plurality of piezoelectric elements, the piezoelectric elements deformable in response to an applied electric field;

a plurality of first and second top electrodes disposed on a top surface of the plurality of piezoelectric elements;

wherein each set of piezoelectric elements and first and second top electrodes are vertically stacked upon one another.

17. The microactuator of claim 16 further comprising:

a first endcap electrically coupled to each of the plurality of first top electrodes;

a second endcap electrically coupled to each of the plurality of second top electrodes.

18. A method of fabricating microactuators comprising:

applying a first and a second electrode to a top surface of a green piezoelectric material to form a wafer;

firing the wafer to generate a perovskite phase;

dicing the wafer to define a length of the microactuators;

applying a first and a second endcap to ends of the wafer perpendicular to the electrodes; and

dicing the wafer to singulate individual microactuators from the wafer.

19. The method of claim 18 wherein the wafer consists of a plurality of layers of the piezoelectric material, each of the plurality of layers having a first and a second electrode on a top surface.

20. The method of claim 19 wherein the first and the second electrode on each of the plurality of layers is mechanically aligned.

21. The method of claim 18 further comprising the step of baking the wafer to remove organic substances from the piezoelectric material.

22. The method of claim 18 further comprising the step of poling the piezoelectric material by application of an electric field at an elevated temperature.

23. The method of claim 18 wherein the step of applying the first and the second endcap is performed using a metal organic chemical vapor deposition (MOCVD) technique.

24. The method of claim 23 wherein the MOCVD technique is used to apply the first and the second endcap constructed from a metal selected from the group consisting of platinum, palladium, and gold.

25. The method of claim 18 further comprising the step of mixing a green state piezoelectric material slurry.

26. The method of claim 25 further comprising the step of spreading the green state piezoelectric material slurry on a substrate at a thickness of about 10 to about 20 microns.

27. The method of claim 18 wherein the first and the second electrode are applied by a technique selected from the group consisting of screen printing, spinning, patterning, evaporative deposition, and sputtering.

28. The method of claim 18 wherein the first and the second electrode are applied using a metal organic chemical vapor deposition (MOCVD) technique.

29. The method of claim 18 wherein the first endcap is applied to an end of the wafer such that it electrically contacts the first electrode and the second endcap is applied to another end of the wafer such that it electrically contacts the second electrode.

09553220 .042000